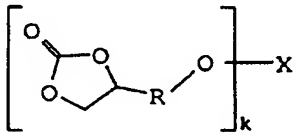
Patent claims

1. A process for modifying a substrate which has functional groups which are selected from hydroxyl groups and primary and secondary amino groups, in which at least one substrate is brought into contact with a compound of the formula I or II under conditions such that the functional groups react, with opening of the 1,3-dioxolane ring or 1,3-diazaheptane ring and formation of a covalent bond, with the compound of the formula I or II



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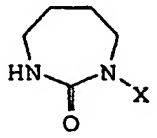


II

in which
R is C_1-C_{12}-alkylene;
if k is 1, X is CO-CH=CH_2, CO-C(CH_3)=CH_2, CO-O-aryl, C_2-C_6-alkylene-SO_2-CH=CH_2 or CO-NH-R^1; and
R^1 is C_1-C_{30}-alkyl, C_1-C_{30}-haloalkyl, C_1-C_{30}-hydroxyalkyl, C_1-C_6-alkoxy-C_1-C_{30}-alkyl, C_1-C_6-alkylcarbonyloxy-C_1-C_{30}-alkyl, amino-C_1-C_{30}-alkyl, mono- or di(C_1-C_6-alkyl)amino-C_1-C_{30}-alkyl, ammonio-C_1-C_{30}-alkyl, polyoxyalkylene-C_1-C_{30}-alkyl, polysiloxanyl-C_1-C_{30}-alkyl, (meth)acryloyloxy-C_1-C_{30}-alkyl, sulfono-C_1-C_{30}-alkyl, phosphono-C_1-C_{30}-alkyl, di(C_1-C_6-alkyl)phosphono-C_1-C_{30}-alkyl, phosphonato-C_1-C_{30}-alkyl, di(C_1-C_6-alkyl)phosphonato-C_1-C_{30}-alkyl or a saccharide radical and,

if k is an integer of more than 1, X is (i) the radical of a polyamine to which the moiety in brackets in the formula is bonded via (CO)NH groups, or (ii) a polymeric skeleton to which the moiety in brackets in

the formula is bonded via (CO), NH-C_2-C_6-alkylene-O-(CO) or (CO)-O-C_2-C_6-alkylene-O(CO) groups.

2. The process as claimed in claim 1, the substrate being selected from biomolecules, polymers or surfaces.

3. The process as claimed in claim 2, the substrate being a polymer.

4. The process as claimed in claim 3, in the compound of the formula I or II X being CO-NH-R^1 and at least some of the radicals R^1 being ammonioalkyl.

5. The process as claimed in claim 4, some of the radicals R^1 being radicals differing from ammonioalkyl.

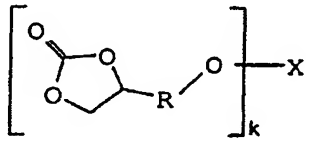
6. The process as claimed in claim 1, the compound of the formula I or II being brought into contact with a first substrate under conditions such that a covalent bond forms between a first end of the compound of the formula I or II and the first substrate, and the reaction product being brought into contact with a second substrate under conditions such that a covalent bond forms between a second end of the compound of the formula I or II and the second substrate.

7. The process as claimed in claim 6, the first and/or second substrate being selected from biomolecules, polymers or surfaces.

8. The process as claimed in claim 7, the polymer being selected from polyalkyleneamines, polyvinylamine, polyallylamine, polyethylenimine, chitosan, polyamide/epichlorohydrin resins, polyaminostyrene, peptides or proteins.

9. The process as claimed in any of the preceding claims, the compound of the formula I being selected from 4-phenyloxycarbonyloxymethyl-2-oxo-1,3-dioxolane, 4-(4-phenyloxycarbonyloxy)butyl-2-oxo-1,3-dioxolane, 2-oxo-1,3-dioxolan-4-ylmethyl acrylate, 2-oxo-1,3-dioxolan-4-ylmethyl methacrylate, 4-(2-oxo-1,3-dioxolan-4-yl)butyl acrylate, 4-(2-oxo-1,3-dioxolan-4-yl)butyl methacrylate, 4-(vinylsulfonylethoxy)butyl-2-oxo-1,3-dioxolane.

10. A compound of the formula I or II



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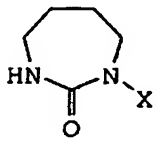

II

in which R is C_1-C_{12}-alkylene;
if k is 1, X is C_2-C_6-alkylene-SO_2-CH=CH_2 or CO-NH-R^1;
and R^1 is C_1-C_{30}-alkyl, C_1-C_{30}-haloalkyl, C_1-C_{30}-hyroxyalkyl, C_1-C_6-alkoxy-C_1-C_{30}-alkyl, C_1-C_6-alkylcarbonyloxy-C_1-C_{30}-alkyl, amino-C_1-C_{30}-alkyl, mono- or di(C_1-C_6-alkyl)amino-C_1-C_{30}-alkyl, ammonio-C_1-C_{30}-alkyl, polyoxyalkylene-C_1-C_{30}-alkyl, polysiloxanyl-C_1-C_{30}-alkyl, sulfono-C_1-C_{30}-alkyl, phosphono-C_1-C_{30}-alkyl, di(C_1-C_6-alkyl)phosphono-C_1-C_{30}-alkyl, phosphonato-C_1-C_{30}-alkyl, di(C_1-C_6-alkyl)phosphonato-C_1-C_{30}-alkyl or a saccharide radical and,

if R is C_2-C_{12}-alkylene, X may also be CO-aryl, CO-CH=CH_2, CO-C(CH_3)=CH_2 or (meth)acryloyloxy-C_1-C_{30}-alkyl-NH-CO,

or if k is an integer of more than 1, X is the radical of a polyamine to which the moiety in brackets in the

formula is bonded via (CO)NH groups.

11. The compound as claimed in claim 10, in which R^1 is
$-(CH_2)_n-CH_3$,
$-(CH_2)_n-(CF_2)_m-CF_3$,
$-(CH_2)_n-[Si(CH_3)_2-O]_p-H$,
$-(CH_2)_n-Si(OSi(CH_3)_3)_3$,
$-(CH_2)_n-(O-CH_2-CHR^4)_p-OR^3$,
$-R^2-OH$,
$-R^2-NH_2$,
$-R^2-NR^3{}_3{}^+Y^-$,
$-R^2-SO_3H$,
$-R^2-PO_3H_2$,
$-R^2-OPO_3H_2$
or a saccharide radical,
R^2 being C_1-C_{18}-alkylene, R^3 being C_1-C_{18}-alkyl or benzyl and R^4 being hydrogen or methyl,
Y being one equivalent of an anion,
n and m independently of one another, being an integer from 0 to 12; and
p being an integer from 1 to 100.

12. The compound as claimed in claim 10, selected from
4-(4-phenyloxycarbonyloxy)butyl-2-oxo-1,3-dioxolane,
2-oxo-1,3-dioxolan-4-ylmethyl acrylate,
2-oxo-1,3-dioxolan-4-ylmethyl methacrylate,
4-(2-oxo-1,3-dioxolan-4-yl)butyl acrylate,
4-(2-oxo-1,3-dioxolan-4-yl)butyl methacrylate,
4-(vinylsulfonylethoxy)butyl-2-oxo-1,3-dioxolane.

13. A modified polymer obtainable by the process as claimed in any of claims 3 to 5.

14. The use of the modified polymer as claimed in claim 13 as a finish, dispersant, emulsifier, adhesion promoter, adhesive or contact adhesive, for modifying surfaces or for immobilizing active substances.